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## THE QUADRUPEDS OF ARIZONA.

BY DR. ELLIOTT COUES, U. S. A.

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(Concluded from p. 400.)

FAMILY *Hystrioidæ*, the Porcupines. The yellow-haired Porcupine (*Erethizon epixanthus*) is a large and handsome species, which replaces the common one in the Western regions. Besides being somewhat larger than the last, there are differences in the color of the hair and quills, and some peculiarities of the cranial bones. I believe nothing has been observed regarding its habits whereby it differs from the Eastern species (*E. dorsatum*). It is particularly abundant along the Colorado Chiquito River, and nearly all our explorers have obtained one or more specimens in that vicinity.

Family *Leporidae*, the Hares. Two species of the family are very abundant, and generally distributed over the Territory. These are the Great "Jackass" Hare (*Lepus callotis*), and the Sage Rabbit (*L. artemisia*). Certain other species, as *L. Californicus*, in the Colorado Valley, or *L. campestris*, in Northern Arizona, may possibly occur; but the two first named are the only common and characteristic ones.

The Jackass Hare includes in its extensive range nearly all the great Western prairies extending into Texas and New Mexico, and is, in places suited to its wants, a very abundant animal. In some desert regions it and the Coyoté are almost the only animals of any size to be found, and it is difficult to imagine how they derive nourishment from such forbidding localities. It must feed largely upon sage-brush, grease-wood, kreosote-plant, young mimosas, and the like; for these constitute the main features of

the flora over large tracts, where grasses and succulent herbs are mostly wanting. Its flesh is said to derive a bitter taste from this sort of food; though I have eaten these hares from various regions without noticing any difference in their quality. At Fort Whipple, the species is very common the year round, and almost every sort of locality is frequented by them, though they chiefly affect grassy meadows and open glades, interspersed with copses, or clumps of oak trees, or patches of briery undergrowth. The gulches or "washes" as they are called, leading out of mountain ravines, and thickly set with grease-wood (*Obione canescens*), are favorite resorts. They feed much upon this plant; and by their incessant coursings through patches of it, they wear little intersecting avenues, along which they ramble at their leisure. When feeding at their ease, and unsuspecting of danger, they move with a sort of lazy abandon, performing a succession of careless leaps, now nibbling the shrubs overhead, now the grass at their feet. They are not at all gregarious, though peculiar attractions may bring many together in the same spot. They do not burrow, but construct a "form" in which they squat. I do not think these are permanent; but rather that they are extemporized, as wanted, in some convenient bush; though the case may be different during the season of reproduction. It has been stated by some authors, that only two or three are produced at a birth, which I know to be at least not always the case, having found as many as six embryos in the multipartite womb of a pregnant female. In the latitude of Fort Whipple the young are brought forth in June.

Although so timid, like all hares, this species will admit of a very close approach when it fancies itself hidden

in its form; though it hardly squats so pertinaciously, nor is it so easily concealed as the little Sage Rabbit, on account of its size. Trembling at heart, yet with motionless body and eyes intently regarding the intruder, it sits all doubled up, as it were, the head drawn in, and the long ears laid flat upon its back, until one may almost touch it, when, with a great bound, it straightens out, clears the first intervening bush, and is off like the wind. It has a long swinging gallop, and performs prodigious leaps, some of them over bushes four feet high; now in the air, its feet all drawn together and down stretched; now on the ground, which it touches and rebounds from with marvellous elasticity. It will course thus for a hundred yards or so, and then stop as suddenly as it started; and, sitting erect, its long wide open ears, vibrating with excitement, are turned in every direction to catch the sound of following danger. The eye and hand of the sportsman who would cut short the first rush of the Hare must be quick, or he will be more likely to behold only a "rear elevation" of his game than to see it lying upon its side in the agonies of death, playing the prelude to its last appearance, in the culminating scene of its brief life's drama.

The skin of this species is very thin, tender, and easily torn, and nearly worthless for any practical purpose. After parted with by its owner, it is only fit for a naturalist to puzzle over, in the attempt to determine its species. In the regions where I studied the animals, there is no appreciable difference in color, between summer and winter pelages. They are always yellowish fulvous above, grizzled with gray, dusky, and black; and dull white below, tinged with fulvous on the throat. There is a longitudinal stripe of pure black on the rump, and ex-

tending on the upper surface of the tail ; the under surface of which, as well as the surrounding parts, are white. The long ears are mostly grayish, or slightly fulvous, their posterior margins pure white, and their broad ends pure black for an inch or more. This parti-coloration heightens the conspicuousness which their size alone would give them.

The Sage Rabbit (*L. artemisia*) is as abundant in Arizona as the Jackass-rabbit ; and, like the latter, has an exceedingly extensive range throughout the West, from the Missouri region into Mexico, wherever the sage-bush, and other desert shrubs are found. It seems rather to avoid rich, grassy, and well-watered regions, and to take up its abode in the most sterile and desolate localities. Besides ordinary desert tracts, it shows a fondness for rocky, broken, and precipitous places, such as are usually shunned by the larger species, though the two are often found side by side. It burrows in the ground, and also lives under rocks, or in the crevices between them. It is a squat, buncy little species, and its gait differs greatly from that of the hare. It runs close to the earth, and instead of bounding over obstacles, scuttles around them with great agility. It is quite as difficult to shoot as the Jackass ; for although slower of foot, yet it runs in a more tortuous and zigzag course. It squats so pertinaciously in its hiding-places, that a small bush may be kicked several times before it will come out. It may not be generally known that this species, at least in some localities, changes its colors considerably in winter. At Fort Whipple I procured one in January, whose fur was very long, thick, and soft, and without a trace of the brownish or fulvous so conspicuous in summer. It was pretty much all over of a clear mouse or steel gray,

which, on various parts, particularly the belly and limbs, passed into white, more or less pure.

Order *Ruminantia*, the Ruminants. Both naturalists and hunters distinguish two species of Deer in Arizona, called the Black-tailed and the White-tailed. Of these the former is by far the most abundant and characteristic; although, judging from accounts formerly given of it, it has considerably decreased in numbers owing to the persecution to which it is subjected so constantly from both the native tribes and the white settlers. It is the *Cervus macrotis* of Mr. Say; and is also called the "Mule Deer," from the length of its ears. A novice, on seeing it for the first time, running directly from him, would hardly think to call it "black-tailed," but rather the reverse. The black exists only on the upper surface of the tail, and near the end; and, as this member is ordinarily elevated and vibrated from side to side as the animal bounds off, only the white of the under surface and neighboring parts is exposed to view. This deer forms no small share of the food and clothing both of the Indians and white settlers. The former have as yet not generally obtained fire-arms, and in the chase resort to a peculiar stratagem, to be more particularly noticed in speaking of the Antelope. That their artifice is ordinarily successful is abundantly proved by the numbers of buckskins to be found in their rancherias. They possess the art of dressing them very perfectly, which is the more remarkable considering the primitive means they employ. Unlike the skins of lynxes, foxes, etc., those of the deer have the hair removed, and are dressed as cloth, to be used for a great variety of purposes besides clothing.

The horns of this species differ somewhat in configuration, though not materially in size, from those of the Vir-

ginian, or of the Columbian Deer. At their roots they are corrugated and nodulated for a short distance, when a small curved basal snag is given off. Near the middle they fork into two about equal branches, being widened and flattened just at the point of divarication. Each of these branches is again dichotomous not far from its middle, one of the terminal forks being ordinarily larger than the other. The whole amount of curvature of the main stem of the antler is rather less than in some other species. The horns are shed in the spring, and the new ones are in the velvet during the great part of the summer. By October, both sexes have finished changing their light coarse summer vesture for the softer and thicker winter coat, which, for some time after the change is completed, is extremely sleek and glossy. Its color is darker than it is in summer, being chiefly mouse-gray, finely waved or annulated with lighter and darker shades. In summer, there is much of a brownish or even fulvous tinge on many parts. The fawns are brought forth in June or July, either one or two at a time. They are at first of a light reddish-brown,—whence our familiar term “fawn-color,”—beautifully spotted with pure white, which is mostly disposed in straight rows.

Except at certain seasons, this deer is more apt to be found singly than in herds of any size. But frequently in the autumn two or three are seen together; and on one occasion in October, I enjoyed the rare sight of twenty or thirty feeding together in a little open glade among thick pine woods. It is not an inhabitant of open prairie land, and is but rarely to be seen in such situations. Thinly wooded tracts of country, interspersed with oaks or junipers; hills and mountain sides covered with pines, as well as those places known as “chaparrals,” are its favor-

ite resorts. In warm weather, and particularly during the heat of the day, after its morning graze and drink, it is fond of repairing to the thickest brush, where it lies down, and doubtless sleeps, as at such times it may be more easily and nearly approached than at others.

I cannot positively determine the White-tailed Deer of Arizona, as I never procured a specimen. It may be a race of *C. Virginianus*, or that species called *C. Mexicanus* in Professor Baird's work, or not impossibly the *C. leucurus* Douglass. The white-tailed deer of our continent are all so closely allied, that it requires a practised eye and patient labor to distinguish them with any degree of certainty; and I believe it is a question with some, whether they all are not merely local races of one common stock.

Though the dry plains of Arizona are not frequented by deer, still they are not wanting in inhabitants among the beasts "that cleave the hoof." Over them the Pronghorned Antelope (*Antilocapra Americana*), the swiftest animal of America, runs races with the winds, making the long miles shrink into mere spans at the touch of his almost magic hoofs, whose impress upon the green sward writes down, in wild yet graceful stanzas, the "poetry of motion" which every attitude and movement of his supple form embodies. As on the land-sea of the Great Plains, so on every land-lake of Arizona he is at home; for home to him means the grassy surface of the earth, where his food is under and around him, and water may be reached by a bagatelle canter of a score or so of miles.

Every one has heard of that strange trait of the Antelope's character, which leads it irresistibly to approach any unusual object which it cannot make out, for a nearer view of the thing which so forcibly excites its astonish-



ment as to overcome its natural timidity. This remarkable curiosity is taken advantage of by hunters, to lure the animal within range, by displaying some brightly-colored piece of cloth, while they lie concealed close by, rifle in hand. The shallower the artifice, the more it seems likely to succeed; a handkerchief fluttering from the end of a ramrod, or even the hunter himself standing on his head and gesticulating with his heels, have compassed the death of many an antelope. But the Indians seem rather to surpass the white man in ingenuity, or rather in a sort of instinctive sagacity, perhaps born of necessity; and take advantage, not only of the common weaknesses of the species, but of that emotion or rather passion which at times absorbs all others, as it should, since on it depends the maintenance of the species, while the rest affect the life of an individual alone. They skin the head and neck of a buck antelope, and stretch the skin, after proper stuffing and drying, upon a light framework, the bottom of which is a hoop which fits their own heads. The horns are scraped or shaven, until they are thin and light, though still preserving their shape. This primitive taxidermy produces an imitation of an antelope's head, which at a little distance is very perfect, and the artifice is very successful during the rutting season. Concealing their bodies, the hunters expose the false mask, and imitate the motions and noises of the now pugnacious and easily excited buck. The latter, flushed with sexual vigor, hears the challenge, and sees the menacing attitudes of his supposed rival, upon whom he advances to offer battle in the cause of the object of his passion, who may be feeding quietly near by, affecting not to notice the fiery zeal of her lord. The bowstring twangs, and the feathery shaft does its bloody work for

him; while she bounds off, with terror and regret, and soon solaces her *ad interim* woe with another conquest.

This animal takes its common name from the peculiar shape of its horns, which have a single somewhat triangular prong jutting from near the base or middle of the shaft, and sometimes flattened or somewhat bent like a scroll. But the position of this prong, as well as its shape and size, varies greatly; while the length and apical curvature of the main shaft is equally variable. Scarcely any two pair of horns are precisely similar in these points, and a second species has even been characterized upon these differences alone. The curious reader will find a great variety figured in Plate XXV. of Professor Baird's work. A pair which I obtained in Arizona were of very unusual shape. They were most like Fig. 890 *a* of the plate referred to, having a very large, flat, triangular prong springing from their very bases; but their tips bent over till they pointed directly downwards, in a direction quite parallel to the axis of the shaft, which is a degree of curvature rarely seen. It is scarcely necessary to add, that the Antelope's horns are not deciduous, like the antlers of the deer, but permanent, like the horns of rams and bulls.

Arizona has woods and plains which are roamed over by the deer and antelope; but a great portion of her territory is unfitted for either of these, being upheaved into lofty mountain ranges and precipitous cliffs, or rent asunder in yawning chasms, and rocky cañons, by the rude shocks it has undergone through the convulsive violence of volcanic action. Masses of plutonic rocks are piled up in wild confusion, and black lava vomit is poured over miles of surface. In the most rugged and broken regions, rarely visited by man, or inaccessible to him, and

amid scenes that are terribly grand in their frowning desolation, is the favorite home of the Rocky Mountain Sheep (*Ovis montana*). Fearless and intrepid, fully trusting his powers, he stands in bold relief upon the edge of some abyss,—his massive horns, and towering form, and sinewy limbs clearly delineated,—the centre-piece of a great picture whose background may be a mountain or the sky itself. He stands a fitting headstone for the graves of the Titans, now quietly slumbering beneath the mighty monuments they erected to their own memory with their last convulsive throes.

The Mountain Ram has a very extensive range, which includes nearly all the elevated mountains and broken regions from our northernmost Territories into Mexico. In Arizona it has been formerly much more abundant than now, for though it still exists in the more inaccessible portions, it is rarely to be seen. But its great horns may be found scattered about the bases of nearly every cliff and precipice.

There is abundant evidence that the Buffalo (*Bos Americanus*) formerly ranged over Arizona, though none exist there now. The habitat of this "monarch of the plains" is contracting year by year, and its numbers are gradually diminishing. Like the Indian, the buffalo seems doomed to disappear before the overwhelming tide of advancing civilization, and must before long, though not in our day, be known only in history. The nature and needs of both are diametrically opposed to the spirit of the white man's progress; and in the inevitable conflict,—with them for bare existence, with us for supremacy,—they cannot hold their own. Sad spectacle, this passing away of a race of men, and of a species of animal; yet in strict obedience to an inexorable, mysterious

law of Nature, which determines the origin, duration, and ending of every form of animal life, by the operation of forces of which we can see dimly some disjointed fragments, but cannot hope to ever wholly comprehend.

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## THE LAND SNAILS OF NEW ENGLAND:

BY EDWARD S. MORSE.

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(Continued from page 414.)

THE following species belong to a group of small snails, whose thin polished shells furnish a distinguishing character. *Helix indentata*, described in the October number, belongs to this group. We promise that those who may have become interested in these papers will find the task of identification growing more and more difficult as we proceed, as with few exceptions the shells have very few distinguishing marks, and the differences are only prominent to those who make it a study.

HELIX CELLARIA *Müller*. (Fig. 29.) The shell of this species is flattened; spire depressed, shining; whorls five, thickened within at the base; color pale horn, opaque white below. Diameter less than half an inch. Animal light indigo-blue, darker on head and tentacles. This species is not a native of this country. It has been imported from Europe to our shores through the medium of commerce. As these snails are generally confined to cellars and gardens, their eggs have probably been brought to this country on wine-casks or on the roots of hot-house plants. In a previous number we have dwelt on the extreme vitality possessed by the eggs of this family. A lady in Portland, in whose cellar

